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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/421,625	10/19/1999	EUGENE P. MARSH	M122-1284	4404

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EXAMINER
VU, HUNG K

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 03/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/421,625	Applicant(s) MARSH, EUGENE P.	
	Examiner Hung K. Vu	Art Unit 2811	

-- Th MAILING DATE of this communication app ars on the cover she t with the correspond nc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 January 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *65-67,74 and 77-85* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *65-67,74 and 77-85* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *Figs 1A-1D* .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 74 and 78 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakamura (PN 6,232,629).

Nakamura discloses a capacitor comprising,

A first capacitor electrode (32) over a monocrystalline silicon substrate (102);

A second capacitor electrode (35);

A dielectric layer (8) between the first and second capacitor electrodes;

Wherein at least one of the first and second capacitor electrodes comprise roughened platinum, the roughened platinum having a continuous surface characterized by columnar pedestals having heights greater than or equal to about one-third of a total thickness of the

roughened platinum. Note Figures 1 – 35 (especially Figures 2, 3A, 7 – 10D, and 24 – 32) of Nakamura.

With regard to claim 78, Nakamura discloses an integrated circuit comprising,

A semiconductive substrate (102);

A conductive node (106) location disposed with the semiconductor substrate;

A first layer (111) disposed over the semiconductive substrate and in electrical contact with the conductive node, the first layer comprising at least one of iridium, rhodium, ruthenium, palladium, osmium, silver, alloy, IrO_2, RuO_2, RhO_2, or OsO_2;

A platinum alloy layer (112) disposed over the firs layer, the platinum alloy layer characterized by a continuous, roughened outer surface, where the platinum alloy layer comprising platinum and at least one of rhodium, iridium, ruthenium, palladium, osmium or silver.

2. Claim 74 is rejected under 35 U.S.C. 102(e) as being anticipated by Aoki et al. (PN 6,033,953, of record)

Aoki et al. discloses a capacitor comprising,

A first capacitor electrode (38) over a monocrystalline silicon substrate (1);

A second capacitor electrode (37);

A dielectric layer (40) between the first and second capacitor electrodes;

Wherein at least one of the first and second capacitor electrodes comprise roughened platinum, the roughened platinum having a continuous surface characterized by columnar

pedestals having heights greater than or equal to about one-third of a total thickness of the roughened platinum. Note Figures 1A-14 (especially Figures 1B-1D) of Aoki et al..

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 65-67, 77, and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki et al. (PN 6,033,953, of record) in view of Kingon et al. (PN 5,555,486).

Aoki et al. discloses a capacitor comprising,

a substrate (1);

a roughened platinum layer (38) over the substrate, the roughened platinum layer having a continuous surface characterized by columnar pedestals;

an intervening layer (39) between the platinum layer and the substrate. Note Figures 1A-14 (especially Figures 1B-1D) of Aoki et al..

Aoki et al. discloses the intervening layer comprising titanium nitride. Aoki et al. does not disclose the intervening layer comprising at least one of IrO_2, RuO_2, RhO_2, or OsO_2. However, Kingon et al. discloses an intervening layer (22), formed under a platinum layer (23), comprising at least one of IrO_2, RuO_2, RhO_2, or OsO_2. Note Figures 1a of Kingon et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the intervening layer of Aoki et al.'s comprising at least one of IrO_2, RuO_2, RhO_2, or OsO_2, such

as taught by Kingon et al. in order to improve the capacitor performance both in terms of fatigue and leakage current.

Although Aoki et al. and Kingon et al. do not teach the exact the thickness of the platinum layer and the height of columnar pedestals, as that claimed by Applicants, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the platinum layer and the columnar pedestals of Aoki et al.'s and Park et al. having a desire thickness and height, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With regard to claim 66, Aoki et al. discloses wherein the pedestals terminate in dome-shaped tops.

With regard to claim 67, Aoki et al. discloses wherein the pedestals terminate in hemispherical tops.

With regard to claim 85, Aoki et al. and Kingon et al. disclose all of the claimed limitations except the roughened platinum layer comprises a platinum alloy comprising platinum and at least one of rhodium, ruthenium or palladium. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the roughened platinum layer

comprises a platinum alloy comprising platinum and at least one of rhodium, ruthenium or palladium in order to provide thermal stability at high temperatures.

4. Claims 78 - 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buskirk et al. (PN 6,010,744) in view of Park et al. (EP 0855738A2, of record).

Buskirk et al. discloses an integrated circuit comprising,

A semiconductive substrate;

A conductive node (13) location disposed with the semiconductor substrate;

A first layer (17) disposed over the semiconductive substrate and in electrical contact with the conductive node;

A platinum alloy layer (18) disposed over the firs layer, the platinum alloy layer characterized by a continuous, roughened outer surface, where the platinum alloy layer comprising platinum and at least one of rhodium, iridium, ruthenium, palladium, osmium or silver.

Buskirk et al. discloses the intervening layer comprising titanium. Buskirk et al. does not disclose the intervening layer comprising at least one of iridium, rhodium, ruthenium, platinum, etc. However, Part et al. discloses an intervening layer (104), formed under a platinum layer (108), comprising at least one of titanium, iridium, rhodium, ruthenium, platinum, etc.. Note Figures 1a-2c of Park et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the intervening layer of Buskirk et al.'s comprising at least one of titanium, iridium, rhodium, ruthenium, platinum, etc., such as taught

by Park et al. because titanium, iridium, rhodium, ruthenium, platinum, etc. are common used and interchangeable.

With regard to claims 79-81, although Buskirk et al. and Kingon et al. do not teach the exact the thickness of the platinum alloy layer, as that claimed by Applicants, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the platinum alloy layer of Aoki et al. and Park et al. having a desire thickness, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

5. Claims 65-67, 77, and 79-85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura (PN 6,232,629).

Nakamura discloses a capacitor comprising,

a substrate (102);

a roughened platinum layer (112) over the substrate, the roughened platinum layer having a continuous surface characterized by columnar pedestals;

an intervening layer (111) between the platinum layer and the substrate, the intervening layer comprising at least one of IrO_2, RuO_2, RhO_2, or OsO_2.. Note Figures 1 – 35 (especially Figures 2, 3A, 7 – 10D, and 24 – 32) of Nakamura.

Nakamura does not teach the exact the thickness of the platinum layer and the height of columnar pedestals, as that claimed by Applicants, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the platinum layer and

the columnar pedestals of Nakamura having a desire thickness and height, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With regard to claim 66, Nakamura discloses wherein the pedestals terminate in dome-shaped tops.

With regard to claims 67 and 84, Nakamura discloses wherein the pedestals terminate in hemispherical tops.

With regard to claim 85, Nakamura discloses all of the claimed limitations except the roughened platinum layer comprises a platinum alloy comprising platinum and at least one of rhodium, ruthenium or palladium. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the roughened platinum layer comprises a platinum alloy comprising platinum and at least one of rhodium, ruthenium or palladium in order to provide thermal stability at high temperatures.

Response to Arguments

6. Applicant's arguments filed 01/03/02 have been fully considered but they are not persuasive.

It is argued, at page 7 of the Remarks, that Aoki et al. does not disclose a roughened platinum layer characterized by columnar pedestals. This argument is not convincing because Aoki et al.

shows, in red-mark Figures 1A – 1D, a roughened platinum layer characterized by columnar pedestals. Therefore, Applicants' claims 65 and 74 do not distinguish over the Aoki et al. reference.

7. Applicant's arguments with respect to claim 65 and 74 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung K. Vu whose telephone number is (703) 308-4079. The examiner can normally be reached on Mon-Thurs 7:00-5:30, Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Vu

March 4, 2002

Tom Thomas

TOM THOMAS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

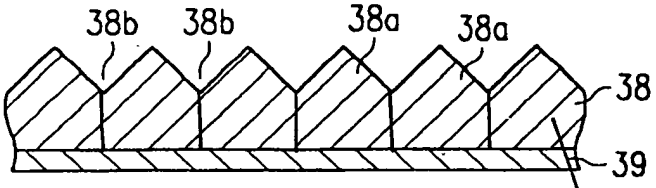

FIG. 1A

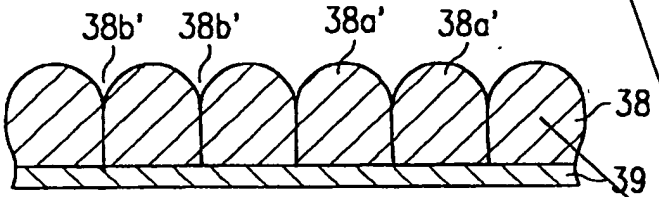

FIG. 1B

Columnar pedestals

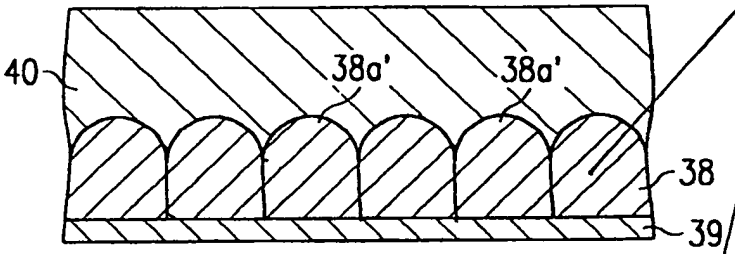

FIG. 1C

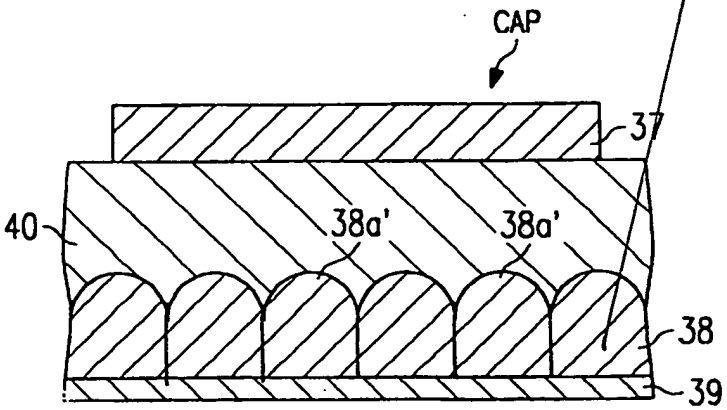

FIG. 1D

Attachment